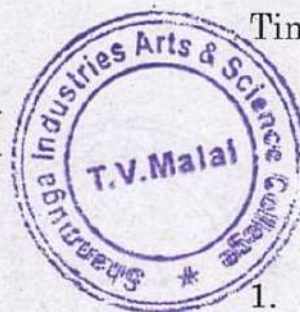


18. Analyze the mechanisms of antigen processing and presentation in T-cell mediated immune responses.
  19. Write a detailed account of hypersensitivity types III and IV, including their pathophysiology and clinical relevance.
  20. Explain the immunological basis of ABO and Rh blood grouping and its significance in transfusion medicine.
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**APRIL/MAY 2025**  
**FBT41/CBT41/BBT41 – IMMUNOLOGY**

Time : Three hours

Maximum : 75 marks

**SECTION A — (10 × 2 = 20 marks)**

Answer ALL Questions.

1. How does the thymus contribute to T-cell education in the immune system?
2. Explain why the immune response is critical in vaccine efficacy.
3. What makes monoclonal antibodies highly specific for their targets?
4. How can understanding epitopes improve antigen-based drug design?
5. How do cytokines regulate immune cell communication during infection?
6. Why is T-cell activation dependent on antigen-presenting cells?



7. How do MHC molecules influence autoimmune diseases?
8. Provide an example of an autoimmune disease and explain its pathogenesis.
9. How can ABO blood mismatches during transfusion lead to hemolysis?
10. What is the clinical relevance of Type III hypersensitivity in autoimmune disorders?

SECTION B — (5 × 5 = 25 marks)

Answer ALL Questions.

11. (a) How does the immune system differentiate between self and non-self?

Or

- (b) Write about the role of lymphoid organs in sustaining immune homeostasis.

12. (a) Explain the therapeutic applications of monoclonal antibodies in autoimmune diseases.

Or

- (b) How does the interaction between antigens and epitopes enhance the immune response?

13. (a) Discuss how cytokine storms can lead to severe inflammation in infections.

Or

- (b) Explain the importance of T-cell activation pathways in combating cancer.

14. (a) Analyze the involvement of MHC molecules in autoimmune disorders with examples.

Or

- (b) Explain how immunological tolerance is achieved to prevent autoimmune diseases.

15. (a) How is Type II hypersensitivity related to hemolytic disease of the newborn?

Or

- (b) Write about the medical applications of blood grouping in organ transplants.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE Questions.

16. Write a comprehensive note on the role of lymphoid organs in developing innate and adaptive immunity.

17. Discuss the role of monoclonal antibodies in treating cancer and autoimmune diseases, with suitable examples.

